

## **ABSTRACT**

A method of planarizing a spin-on material layer is provided. A substrate having a plurality of openings thereon is provided. A spin-on material layer is formed on the substrate such that the openings are completely filled. A plasma etching process is carried out to remove a portion of the spin-on material layer and expose the substrate surface. During the plasma etching process, the substrate is cooled to maintain an etching selectivity between the spin-on material layer on the substrate surface and the spin-on material layer within the openings so that a planar spin-on material layer is ultimately obtained.